

-continued

<210> SEQ ID NO 6  
 <211> LENGTH: 20  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial Sequence  
 <220> FEATURE:  
 <223> OTHER INFORMATION: primer

<400> SEQUENCE: 6

gtctgagcag tactgtgtgc

20

<210> SEQ ID NO 7  
 <211> LENGTH: 28  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial Sequence  
 <220> FEATURE:  
 <223> OTHER INFORMATION: primer

<400> SEQUENCE: 7

gggggggatcc gcacctggtc atctgtcc

28

<210> SEQ ID NO 8  
 <211> LENGTH: 30  
 <212> TYPE: DNA  
 <213> ORGANISM: Artificial Sequence  
 <220> FEATURE:  
 <223> OTHER INFORMATION: primer

<400> SEQUENCE: 8

gggaagcttc ccggccaggc gcggagatgg

30

What is claimed is:

1. A process for increasing the circulating levels of a self protein in the blood stream of an immunocompetent animal which comprises delivering an adenoviral vector in vivo to muscle cells of said animal by intramuscular injection in an amount sufficient to obtain expression of and increase the circulating level of said self protein in the bloodstream of said animal for a period greater than about 30 days, wherein said self protein is erythropoietin or a growth hormone.
2. The process of claim 1 wherein the animal is a primate.
3. The process of claim 2 wherein the primate is a human.
4. The process of claim 1 wherein the adenoviral vector is a replication defective adenoviral vector.
5. The process of claim 1 wherein the self protein is human erythropoietin.
6. The process of claim 1 wherein the circulating level of the self protein is increased for a period of time greater than about 60 days.
7. The process of claim 1 wherein the circulating level of the self protein is increased for a period of time greater than about 90 days.
8. The process of claim 1 wherein the circulating level of the self protein is increased for a period of time greater than about 120 days.
9. The process of claim 1 wherein the circulating level of the self protein is increased for a period of time ranging from about 90 days to about 365 days.
10. The process of claim 1 wherein the muscle cells are cardiac muscle cells or skeletal muscle cells.
11. A process for increasing the circulating levels of a self protein in the blood stream of an immunocompetent animal which comprises

transforming muscle cells of said animal ex vivo with an adenoviral vector encoding a self protein to thereby produce transformed muscle cells, wherein said self protein is erythropoietin or a growth hormone, and further wherein said self protein undergoes secretion, diffusion, or transport to the circulation upon expression in vivo; and

delivering said transformed muscle cells by intramuscular injection to said animal in an amount sufficient to obtain expression of and increase the circulating level of said self protein in the bloodstream of said animal for a period greater than about 30 days.

12. The process of claim 11 wherein the animal is a primate.
13. The process of claim 12 wherein the primate is a human.
14. The process of claim 11 wherein the adenoviral vector is a replication-defective adenoviral vector.
15. The process of claim 11 wherein the self protein is human erythropoietin.
16. The process of claim 11 wherein the circulating level of the self protein is increased for a period of time greater than about 60 days.
17. The process of claim 11 wherein the circulating level of the self protein is increased for a period of time greater than about 90 days.
18. The process of claim 11 wherein the circulating level of the self protein is increased for a period of time greater than about 120 days.

US 6,613,319 B2

19

19. The process of claim 11 wherein the circulating level of the self protein is increased for a period of time ranging from about 90 days to about 365 days.

20. The process of claim 11 wherein the muscle cells are cardiac muscle cells or skeletal muscle cells.

21. The process of claim 11, wherein said immunocompetent animal is being treated with an immunosuppressant.

20

22. The process of claim 1, wherein said immunocompetent animal is being treated with an immunosuppressant.

23. The process of claim 1 wherein the self protein is human growth hormone.

24. The process of claim 11 wherein the self protein is human growth hormone.

\* \* \* \* \*